

PATENT ABSTRACTS OF JAPAN

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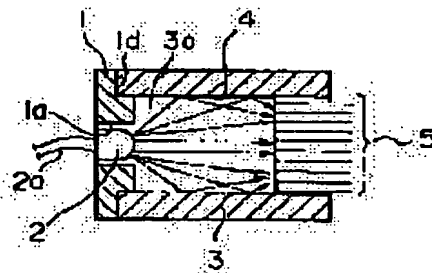
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(54) LED HOLDER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an LED holder with which the transmission of light from one LED to many optical fibers is possible.

SOLUTION: In this LED holder, the LED 2 which receives the power supply from a power source and emits a prescribed light is housed and the photodetecting ends of the plural optical fibers are arranged on the output side of the LED 2. In such a case, the holder is provided with a short cylinder 1 and long cylinder 3 which are connected to each other. The long cylinder 3 is composed of a material having high reflectivity and the inside surface of the long cylinder 3 is so formed as to constitute a reflection surface 4 having prescribed accuracy. The LED 2 is housed in the short cylinder 1 by directing its output side inward. The plural optical fibers 5 are housed and mounted apart a prescribed spacing from the LED 2 arranged in the short cylinder 1 into the space part 3a of the long cylinder 3 formed to the diameter larger than the bore of the short cylinder 1. The emitted light of the LED 2 is transmitted together with the reflected light by the reflection surface 4 of the long cylinder 3 to the optical fibers 5.



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CLAIMS

[Claim(s)]

[Claim 1] In the LED holder which carries out receipt arrangement of the light-receiving edge of two or more optical fibers at the output side of LED which receives the electric supply from a power source and emits light in a predetermined light, and this LED While preparing the short cylinder and ellipse cylinder which are connected mutually and constituting this ellipse cylinder from an ingredient with the high rate of a light reflex While the inside of this ellipse cylinder is formed so that it may become the reflector of predetermined precision, and turning LED to the inside side of said short cylinder, turning that output side to the inner direction and containing Rather than the bore of this short cylinder, separate LED and predetermined spacing which have been arranged in said short cylinder in the space section of said ellipse cylinder formed in the major diameter, and it contains and equips with two or more optical fibers. The LED holder characterized by in addition the reflected light by the reflector of said ellipse cylinder transmitting the luminescence light of said LED to an optical fiber.

[Claim 2] In the LED holder which carries out receipt arrangement of the light-receiving edge of two or more optical fibers at the output side of LED which receives the electric supply from a power source and emits light in a predetermined light, and this LED While lining the light reflex cylinder which prepared the short cylinder and ellipse cylinder which are connected mutually, and was constituted from an ingredient with the high rate of a light reflex in the inside of this ellipse cylinder While the inside of this light reflex cylinder is formed so that it may become the reflector of predetermined precision, and turning LED to the inside side of said short cylinder, turning that output side to the inner direction and containing Rather than the bore of this short cylinder, separate LED and predetermined spacing which have been arranged in said short cylinder at the space section in said light reflex cylinder formed in the major diameter, and it contains and equips with two or more optical fibers. The LED holder characterized by in addition the reflected light by the reflector of said light reflex cylinder transmitting the luminescence light of said LED to an optical fiber.

[Claim 3] The LED holder according to claim 1 or 2 which used aluminum or silver as an ingredient with the high rate of a light reflex which forms the above-mentioned reflector.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to amelioration of the LED holder used for the optical transport device which transmits light using an optical fiber.

[0002]

[Description of the Prior Art] Drawing 2 is the vertical section front view showing the structure of the conventional LED holder.

[0003] It is the short cylinder with which 11 has 11d of cross-section [of L characters]-like steps in this drawing, and the ellipse cylinder by which 13 has 13d of steps, and both fit in an each steps [11d and 13d] part, and are connected with one. Each bore and outer diameter of the short cylinder 11 and the ellipse cylinder 13 are the same, to internal 11a of the short cylinder 11, turned the output side to the inner direction, and have contained LED12. 12a is a feeder to LED12.

[0004] 14 is two or more optical fibers, the light-receiving edge of these optical fibers 14 leaves the space section 15 which counters LED12 to the interior of the ellipse cylinder 13, and it is equipped with it.

[0005] In addition, the bore of the ellipse cylinder 13 by which it is equipped with two or more optical fibers 14 of the gestalt of this operation is about 5mm. .

[0006]

[Problem(s) to be Solved by the Invention] Since the bore of each cylinder with which LED and an optical fiber are contained as mentioned above is the same in the configuration of the conventional LED holder, only the amount of [of the optical fiber of the diameter of said] bundle can equip with an optical fiber mostly with LED.

[0007] For this reason, there were few amounts of luminescence by the optical fiber which can be transmitted with one LED holder, and when applying to a large-sized display, there was a problem of needing many LED holders.

[0008] This invention aims at offering the LED holder which solved the above-mentioned technical problem (trouble) of the conventional thing.

[0009]

[Means for Solving the Problem] In the LED holder which carries out receipt arrangement of the light-receiving edge of two or more optical fibers at the output side of LED which the LED holder of this invention receives the electric supply from a power source, and emits light in a predetermined light, and this LED While preparing the short cylinder and ellipse cylinder which are connected mutually and constituting this ellipse cylinder from an ingredient with the high rate of a light reflex While the inside of this ellipse cylinder is formed so that it may become the reflector of predetermined precision, and turning LED to the inside side of said short cylinder, turning that output side to the inner direction and containing LED and predetermined spacing which have been arranged in said short cylinder in the space section of said ellipse cylinder formed in the major diameter rather than the bore of this short cylinder were separated, and it contained and equipped with two or more optical fibers, and it constituted so that the reflected light by the reflector of said ellipse cylinder might, in addition, also transmit the luminescence

light of said LED to an optical fiber.

[0010] In this case, you may make it line the light reflex cylinder constituted from an ingredient with the high rate of a light reflex in the inside of the ellipse cylinder constituted from ingredients other than this instead of constituting an ellipse cylinder from an ingredient with the high rate of a light reflex.

[0011] What is necessary is just to make it use aluminum or an ingredient with a high reflection factor like silver as an ingredient with the high rate of a light reflex which forms the above-mentioned reflector.

[0012]

[Embodiment of the Invention] Drawing 1 is the vertical section front view showing the structure of an LED holder which shows the gestalt of 1 operation of this invention.

[0013] In this drawing, the short cylinder with which 1 has 1d of cross-section [of L characters]-like steps, and 3 are ellipse cylinders. This ellipse cylinder 3 consists of ingredients of a high reflection factor, such as aluminum, fits one point of the ellipse cylinder 3 into 1d of steps of the short cylinder 1, connects both, and really forms the holder case of an object.

[0014] Therefore, the bore of space section 3a formed in the interior of the ellipse cylinder 3 in a holder case is formed so that it may become magnitude with an abbreviation [for the bore formed in the interior of the ellipse cylinder 13 of the conventional holder case] of about 2 times.

[0015] The inside of this space section 3a shall be formed so that it may be means, such as polish, and may become the reflector (mirror plane) 4 of a predetermined precision.

[0016] LED2 turns an output side to the inner direction, and is contained by internal 1a of the short cylinder 1. In addition, 2a is a feeder to LED2.

[0017] 5 is two or more optical fibers 5, the light-receiving edge of these optical fibers 5 leaves space section 3a of predetermined spacing which counters LED2 to the interior of the ellipse cylinder 3, and it is equipped with it.

[0018] In this case, the ellipse cylinder 3 can be equipped and the number of the optical fibers 5 which convey the luminescence light of LED2 to an indicating equipment (not shown) can be made into the number with which only the part to which the path of space section 3a of the ellipse cylinder 3 increased increased rather than the case of the conventional configuration.

[0019] In addition, in the thing of illustration, since the path of a reflector 4 can be set to about 10mm, the number of the optical fibers contained by the holder case will increase as this path corresponds to the part which became twice the conventional thing.

[0020] The LED holder of this invention is constituted by 1 of a more than thru/or 5.

[0021] In the above configuration, if electric power is supplied to LED2 through feeder 2a, although LED2 emits light in a predetermined color from that output side, since scattered reflection of the light to which this luminescence light hits the reflector 4 of the ellipse cylinder 3 besides the light which progresses straightly is carried out as shown in drawing 1, it will be in the condition that the light of LED2 was amplified in the area direction, in the part of a reflector 4.

[0022] Therefore, since luminescence from LED2 reflects effectively and is told to the optical fiber 5 arranged conventionally even if it is the case where LED which takes out the same quantity of light as the former has been arranged, the luminescence light of LED2 can be transmitted to many light spots in the display (not shown) prepared in the outgoing end of an optical fiber 5. [many]

[0023] This invention is not limited to the thing of the gestalt of the above-mentioned operation.

[0024] For example, although the thing of the gestalt of the above-mentioned operation explained the case where the own ingredient of an ellipse cylinder was constituted from ingredients of a high reflection factor, such as ARUMIUMU Replace with this and an ellipse cylinder uses an ingredient with the low reflection factor of a plastics ingredient etc. What lined aluminum foil or the light reflex cylinder of the thin thick ingredient of a high reflection factor to the inside is prepared. While the inside of this light reflex cylinder is formed so that it may become the reflector of predetermined precision, and turning LED to the inside side of said short cylinder, turning that output side to the inner direction and containing LED and predetermined

spacing which have been arranged in said short cylinder at the space section in said light reflex cylinder formed in the major diameter are separated, it contains and equips with two or more optical fibers, and you may make it the reflected light by the reflector of said light reflex cylinder, also transmit the luminescence light of said LED to an optical fiber in addition rather than the bore of this short cylinder.

[0025] Moreover, although LED2 shown in drawing 1 showed that in which the point was formed circularly, it replaces with this and, of course, the cross-section configuration of a point can apply this invention also to what was formed in the shape of a rectangle.

[0026]

[Effect of the Invention] Since this invention was constituted as mentioned above, it has the following outstanding effectiveness.

[0027] Since scattered reflection of the thing of ***** of the luminescence light from LED is carried out in the reflector formed with the quality of the material with a high reflection factor in case LED which emits light in light, and its light are received with an optical fiber, light spreads to the whole space and can transmit a lot of light to an optical fiber by small LED.

[0028] Therefore, if this optical fiber is used for a display, many unit dots can be displayed and it can contribute to energy saving and a miniaturization of a display.

[0029] Moreover, if aluminum is used as an ingredient which forms a reflector, since aluminum has the operation which light is not leaked outside but reflects it effectively, it is very effective as a reflector of this invention.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the vertical section front view showing the internal structure of the LED holder which shows the gestalt of 1 operation of this invention.

[Drawing 2] It is the vertical section front view showing the internal structure of the conventional LED holder.

[Description of Notations]

1: Short cylinder

1a: Interior

2:LED

3: Ellipse cylinder

3a: Space section

4: Reflector

5: Optical fiber

[Translation done.]

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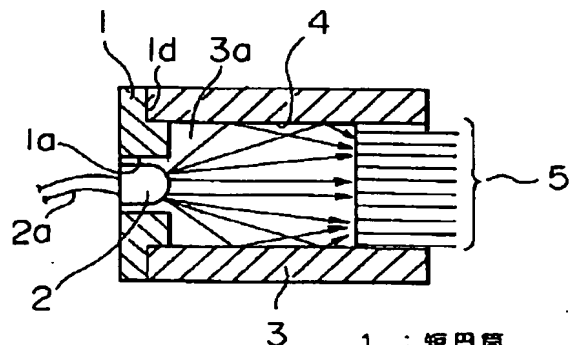
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(54) 【発明の名称】 L E D ホルダ

(57) 【要約】 (修正有)

【課題】 1つのL E Dから従来のものよりも多くの光ファイバに光伝送を行うことができるL E Dホルダを提供する。

【解決手段】 電源からの給電を受け、所定の光を発光するL E D 2とL E D 2の出力側に複数の光ファイバ5の受光端を収納配置するL E Dホルダにおいて、相互に連結される短円筒1と長円筒3とを設け、長円筒3を光反射率の高い材料で構成すると共に、長円筒3の内面を所定精度の反射面4となるように形成し、短円筒1の内面側にL E D 2をその出力側を内方に向けて収納すると共に、短円筒1の内径よりも大径に形成した長円筒3の空間部3 aに短円筒1内に配置したL E D 2と所定間隔を隔てて複数の光ファイバ5を収納・装着し、L E D 2の発光光を長円筒3の反射面4による反射光も加えて光ファイバ5に伝送するように構成した。



1 : 短円筒
1 a : 内部
2 : L E D
3 : 長円筒
3 a : 空間部
4 : 反射面
5 : 光ファイバ

【特許請求の範囲】

【請求項1】 電源からの給電を受け、所定の光を発光するLEDとこのLEDの出力側に複数の光ファイバの受光端を収納配置するLEDホルダにおいて、相互に連結される短円筒と長円筒とを設け、この長円筒を光反射率の高い材料で構成すると共に、この長円筒の内面を所定精度の反射面となるように形成し、前記短円筒の内面側にLEDをその出力側を内方に向けて収納すると共に、この短円筒の内径よりも大径に形成した前記長円筒の空間部に前記短円筒内に配置したLEDと所定間隔を隔てて複数の光ファイバを収納・装着し、前記LEDの発光光を前記長円筒の反射面による反射光も加えて光ファイバに伝送することを特徴とするLEDホルダ。

【請求項2】 電源からの給電を受け、所定の光を発光するLEDとこのLEDの出力側に複数の光ファイバの受光端を収納配置するLEDホルダにおいて、相互に連結される短円筒と長円筒とを設け、この長円筒の内面に光反射率の高い材料で構成した光反射円筒を内張りすると共に、この光反射円筒の内面を所定精度の反射面となるように形成し、前記短円筒の内面側にLEDをその出力側を内方に向けて収納すると共に、この短円筒の内径よりも大径に形成した前記光反射円筒内の空間部に前記短円筒内に配置したLEDと所定間隔を隔てて複数の光ファイバを収納・装着し、前記LEDの発光光を前記光反射円筒の反射面による反射光も加えて光ファイバに伝送することを特徴とするLEDホルダ。

【請求項3】 上記反射面を形成する光反射率の高い材料としてアルミニウム又は銀などを用いるようにした請求項1又は2記載のLEDホルダ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、光ファイバを用いて光を伝送する光搬送装置に用いられるLEDホルダの改良に関する。

【0002】

【従来の技術】図2は従来のLEDホルダの構造を示す縦断正面図である。

【0003】同図において11は断面L字状の段部11dを有する短円筒、13は段部13dを有する長円筒で、両者は各段部11d、13dの部分を嵌合して一体に連結される。短円筒11と長円筒13の各内径及び外径は同一で、短円筒11の内部11aにはLED12を出力側を内方に向けて収納している。12aはLED12に対する給電線である。

【0004】14は複数本の光ファイバで、これらの光ファイバ14の受光端は長円筒13の内部にLED12に対向する空間部15を残して装着される。

【0005】なお、本実施の形態の複数本の光ファイバ14が装着される長円筒13の内径は5mm程度である

【0006】

【発明が解決しようとする課題】従来のLEDホルダの構成の場合、上記のようにLEDと光ファイバとが収納される各円筒の内径が同一であるため、光ファイバはLEDとはほぼ同径の光ファイバの束分しか装着できない。

【0007】このため、1つのLEDホルダによって伝送できる光ファイバによる発光量が少なく、大型の表示装置に適用する場合は多数のLEDホルダを必要とするという問題があった。

【0008】本発明は従来のものの上記課題（問題点）を解決するようにしたLEDホルダを提供することを目的とする。

【0009】

【課題を解決するための手段】本発明のLEDホルダは、電源からの給電を受け、所定の光を発光するLEDとこのLEDの出力側に複数の光ファイバの受光端を収納配置するLEDホルダにおいて、相互に連結される短円筒と長円筒とを設け、この長円筒を光反射率の高い材料で構成すると共に、この長円筒の内面を所定精度の反射面となるように形成し、前記短円筒の内面側にLEDをその出力側を内方に向けて収納すると共に、この短円筒の内径よりも大径に形成した前記長円筒の空間部に前記短円筒内に配置したLEDと所定間隔を隔てて複数の光ファイバを収納・装着し、前記LEDの発光光を前記長円筒の反射面による反射光も加えて光ファイバに伝送するように構成した。

【0010】この場合、長円筒を光反射率の高い材料で構成する代りに、これ以外の材料で構成した長円筒の内面に光反射率の高い材料で構成した光反射円筒を内張りするようにしても良い。

【0011】上記反射面を形成する光反射率の高い材料としては、アルミニウム又は、銀のような反射率が高い材料を用いるようにすれば良い。

【0012】

【発明の実施の形態】図1は本発明の一実施の形態を示すLEDホルダの構造を示す縦断正面図である。

【0013】同図において、1は断面L字状の段部1dを有する短円筒、3は長円筒である。この長円筒3は、例えばアルミニウム等の高反射率の材料で構成され、短円筒1の段部1dに長円筒3の一方の先端部を嵌合して両者を連結し一体物のホルダケースを形成している。

【0014】従って、ホルダケース中の長円筒3の内部に形成される空間部3aの内径は、従来のホルダケースの長円筒13の内部に形成される内径の略2倍程度の大きくなるように形成される。

【0015】この空間部3aの内面は研磨等の手段で、所定の精度の反射面（鏡面）4となるように形成されるものとする。

【0016】短円筒1の内部1aには、LED2が出力

側を内方に向けて収納される。なお、2aはLED2に対する給電線である。

【0017】5は複数本の光ファイバ5で、これらの光ファイバ5の受光端は長円筒3の内部にLED2に対向する所定間隔の空間部3aを残して装着される。

【0018】この場合、長円筒3に装着し、表示装置（図示せず）に対してLED2の発光光を搬送する光ファイバ5の数は、長円筒3の空間部3aの径が増大した分だけ、従来の構成の場合よりも増大した数とすることができる。

【0019】なお、図示のものでは、反射面4の径を例えば10mm程度とすることができるから、この径が従来のものの2倍となった分に対応するだけホルダケースに収納される光ファイバの数が増大されることになる。

【0020】以上の1乃至5により本発明のLEDホルダが構成される。

【0021】以上の構成において、給電線2aを介してLED2に給電すると、LED2はその出力側から所定の色の発光を行うが、この発光光はまっすぐに進む光のほか、長円筒3の反射面4に当たる光は図1に示すように乱反射されるから、反射面4の部分でLED2の光が面積方向に増幅された状態となる。

【0022】従って、従来と同一光量を出すLEDを配置した場合であっても、従来よりも多数配置された光ファイバ5に対してLED2からの発光が有効に反射して伝えられるので、光ファイバ5の出力端に設けられる表示装置（図示せず）における多くの光点に対してLED2の発光光を伝送することができる。

【0023】本発明は上記の実施の形態のものに限定されない。

【0024】例えば、上記の実施の形態のものでは、長円筒自身の材料をアルミニウム等の高反射率の材料で構成する場合について説明したが、これに代え、長円筒はプラスチック材料等の反射率の低い材料を用い、その内面にアルミ箔又は薄い肉厚の高反射率の材料の光反射円筒を内張りしたものを設けるようにし、この光反射円筒の内面を所定精度の反射面となるように形成し、前記短円筒の内面側にLEDをその出力側を内方に向けて収納*

*すると共に、この短円筒の内径よりも大径に形成した前記光反射円筒内の空間部に前記短円筒に配置したLEDと所定間隔を隔てて複数の光ファイバを収納・装着し、前記LEDの発光光を前記光反射円筒の反射面による反射光も加えて光ファイバに伝送するようにしても良い。

【0025】また、図1に示すLED2は先端部が円形に形成されたものを示したが、これに代え、先端部の断面形状が矩形状に形成されたものに対しても、本発明が適用できることは勿論である。

10 【0026】

【発明の効果】本発明は上記のように構成したので、次のような優れた効果を有する。

【0027】光を発光するLEDとその光を光ファイバで受光する際、LEDからの発光光の可成りのものが反射率の高い材質で形成した反射面で乱反射されるため、光は空間全体に拡がり小型のLEDで多量の光を光ファイバに伝送することができる。

【0028】従って、この光ファイバを表示装置に用いれば多数の単位ドットの表示を行うことができ、表示装置の省エネルギー化及び小型化に寄与できる。

【0029】また、反射面を形成する材料としてアルミニウムを用いれば、アルミニウムは光を外部に洩らさず、有効に反射させる作用があるので、本発明の反射面として極めて有効である。

【図面の簡単な説明】

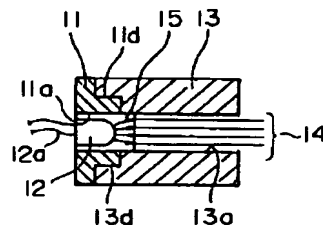
【図1】本発明の一実施の形態を示すLEDホルダの内部構造を示す縦断正面図である。

【図2】従来のLEDホルダの内部構造を示す縦断正面図である。

30 【符号の説明】

- 1：短円筒
- 1a：内部
- 2：LED
- 3：長円筒
- 3a：空間部
- 4：反射面
- 5：光ファイバ

【図2】



(4)

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【図1】

